

Appl. No. 09/706,926
Amdt. dated August 23, 2004
Supplemental Amendment

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method for representing cartographic data in a computer-based system, comprising:

computing a plurality of wavelet and scaling coefficients corresponding to at least one function representing a geographic feature in a cartographic database, wherein said wavelet coefficients obtained with a wavelet, wherein said wavelet being one of a family of functions having a form $\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$, wherein $\psi_{ab}(x)$ is called a mother wavelet, a is called a dilation parameter, b is called a translation parameter, and x is an independent variable; and

storing the wavelet and scaling coefficients in a computer-usable database, the coefficients being usable for representing the cartographic data in the computer-based system.

Claim 2 (original): The method of claim 1, wherein the geographic feature is originally represented by a plurality of data points.

Claim 3 (original): The method of claim 2, wherein the data points are selected from the group consisting of coordinate pairs and a coordinate triples.

Claim 4 (original): The method of claim 1, wherein the geographic feature is the boundary of a feature selected from the group consisting of a road, waterway, building, park, lake, railroad track, and airport.

Claim 5 (original): The method of claim 2, wherein the step of computing the wavelet coefficients and scaling coefficients includes applying a wavelet transform to a function defined by the data points representing the geographic feature.

Claim 6 (original): The method of claim 1, wherein the step of computing the wavelet coefficients and scaling coefficients includes:
computing the wavelet coefficients by performing a least-squares fit.

Claim 7 (original): The method of claim 1, wherein the wavelet and scaling coefficients are computed using a semi-discrete orthonormal wavelet transform.

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Claim 8 (currently amended): A method of displaying on a computer output device a function representing a geographic feature, comprising:

retrieving from a computer-usable database a plurality of wavelet and scaling coefficients associated with the geographic feature, wherein a wavelet being one of a family of functions having a form $\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$, wherein $\psi_{ab}(x)$ is called a mother wavelet, a is called a dilation parameter, b is called a translation parameter, and x is an independent variable, the coefficients being derived from a plurality of data points specifying geographic locations according to a predetermined reference system;
 computing the function representing the geographic feature using the retrieved wavelet and scaling coefficients; and
 displaying the function on the computer output device.

Claim 9 (original): The method of claim 8, wherein the data points are selected from the group consisting of coordinate pairs and a coordinate triples.

Claim 10 (original): The method of claim 8, wherein the geographic feature is selected from the group consisting of a road, waterway, building, park, lake, railroad track, and airport.

Claim 11 (currently amended): A system for displaying on a computer output device a representation of a geographic feature, comprising:

a database storing a plurality of wavelet and scaling coefficients associated with the geographic feature, wherein a wavelet being one of a family of functions having a form $\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$, wherein $\psi_{ab}(x)$ is called a mother wavelet, a is called a dilation parameter, b is called a translation parameter, and x is an independent variable, the wavelet and scaling coefficients being derived from a plurality of data points specifying geographic locations according to a predetermined reference system;
 a processor configured to calculate a function using the wavelet and scaling coefficients, the function representing the geographic feature; and
 a display device for displaying the function.

Claim 12 (original): The system of claim 11, wherein the data points are selected from a group consisting of coordinate pairs and coordinate triples.

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Claim 13 (currently amended): A method of generating a computer-usable database that represents cartographic data using a plurality of wavelet and scaling coefficients, comprising:
 providing a predetermined database that represents the cartographic data using a plurality of data points specifying geographic locations;
 computing a plurality of wavelet and scaling coefficients from the data points, wherein a wavelet being one of a family of functions having a form $\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$,
wherein $\psi_{ab}(x)$ is called a mother wavelet, a is called a dilation parameter, b is called a translation parameter, and x is an independent variable, wherein said wavelet and scaling coefficients are used to represent the cartographic data; and
 storing the wavelet and scaling coefficients in the computer-usable database.

Claim 14 (original): The method of claim 13, wherein the data points are selected from the group consisting of coordinate pairs and coordinate triples.

Claim 15 (original): The method of claim 13, wherein the geographic feature is the boundary of a feature selected from the group consisting of a road, waterway, building, park, lake, railroad track and airport.

Claim 16 (currently amended): A system of generating a computer-usable database that represents cartographic data using a plurality of wavelet and scaling coefficients, comprising:
 a first computer-usable database storing the cartographic data representing using a plurality of data points specifying geographic locations;
 a processor configured to compute a plurality of wavelet and scaling coefficients from the data points, wherein said wavelet and scaling coefficients are used to represent the cartographic data, wherein a wavelet being one of a family of functions having a form $\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$, wherein $\psi_{ab}(x)$ is called a mother wavelet, a is called a dilation parameter, b is called a translation parameter, and x is an independent variable; and
 a second computer-usable database, operatively coupled to the processor, for storing the wavelet and scaling coefficients.

Claim 17 (original): The system of claim 16, wherein the data points are selected from the group consisting of coordinate triples and coordinate pairs.

Claim 18 (original): The system of claim 16, wherein the wavelet coefficients and scaling coefficients are computed by applying a wavelet transform to a function defined by the data points representing a geographic feature.

Claim 19 (original): The system of claim 16, wherein the wavelet coefficients are computed by performing a least-squares fit.

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Claim 20 (currently amended): A method for generating a database error metric in a computer-based system, comprising:

computing a first plurality of wavelet and scaling coefficients from a plurality of first data points included in a first cartographic database, wherein said wavelet and scaling coefficients represent geographic features;

computing a second plurality of wavelet and scaling coefficients from a plurality of data points included in a second cartographic database, wherein said wavelet and scaling coefficients represent geographic features, wherein a wavelet being one of a family of

functions having a form $\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$, wherein $\psi_{ab}(x)$ is called a mother wavelet, a is called a dilation parameter, b is called a translation parameter, and x is an independent variable; and

generating the database error metric based on a wavelet transform involving the first and second pluralities of wavelet coefficients.

Claim 21 (original): The method of claim 20, wherein the error metric is a total error metric based on a plurality of wavelet scales.

Claim 22 (original): The method of claim 20, further comprising:

selecting a wavelet scale; and

restricting the error computation to the selected wavelet scale to generate a layer error metric.

Claim 23 (previously presented): The method of claim 20, wherein the data points are selected from the group consisting of coordinate pairs and coordinate triples.

Claim 24 (currently amended): A system for generating a database error metric, comprising:

a first cartographic database for storing a first plurality of data points;

a second cartographic database for storing a second plurality of data points; and

a processor, operatively coupled to the first and second cartographic databases,

configured to compute a first plurality of wavelet and scaling coefficients and a second plurality of wavelet and scaling coefficients, respectively, from the first and second pluralities of data points, wherein said wavelet and scaling coefficients represent geographic features, wherein a wavelet being one of a family of functions having a form

$\psi_{ab}(x) = |a|^{-1/2} \psi\left(\frac{x-b}{a}\right)$, wherein $\psi_{ab}(x)$ is called a mother wavelet, a is called a dilation parameter, b is called a translation parameter, and x is an independent variable, the processor generating a database error metric based on the first and second pluralities of wavelet and scaling coefficients.

Claim 25 (previously presented): The system of claim 24, wherein the error metric is a total error metric based on a plurality of wavelet scales.

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Claim 26 (original): The system of claim 24, wherein the processor is configured to restrict the error computation to a selected wavelet scale to generate a layer error metric.

Claim 27 (original): The system of claim 24, wherein the data points are selected from the group consisting of coordinate triples and coordinate pairs.